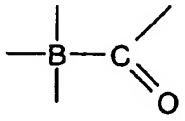
CLAIMS

1. Use of a boranocarbonate compound or ion in the manufacture of a medicament, for the stimulation of neurotransmission, vasodilation or smooth muscle relaxation by CO as a physiologically effective agent, or for the treatment of any of acute or chronic systematic hypertension, radiation damage, endotoxic shock, hyperoxia-induced injury, apoptosis, cancer, transplant rejection, post-operative ileus, arteriosclerosis, post-ischemic organ damage, angina, haemorrhagic shock, sepsis, penile erectile dysfunction, vascular restenosis, hepatic cirrhosis, cardiac hypertrophy, heart failure and ulcerative colitis or for treatment in balloon angioplasty, aortic transplantation or survival of a transplanted organ.

2. Use according to claim 1 wherein the medicament is for the stimulation of neurotransmission, vasodilation or smooth muscle relaxation by CO as a physiologically effective agent, or for the treatment of any of acute or chronic systematic hypertension, hyperoxia-induced injury, cancer by the pro-apoptotic effect of CO, transplant rejection, post-operative ileus, post-ischemic organ damage, angina, haemorrhagic shock, penile erectile dysfunction, hepatic cirrhosis, cardiac hypertrophy, heart failure and ulcerative colitis or for treatment in balloon angioplasty or aortic transplantation.

3. Use according to either claim 1 or claim 2 wherein the medicament is suitable for administration by an oral, intravenous, subcutaneous, nasal, inhalatory, intramuscular, intraperitoneal, transdermal, transmucosal or suppository route.

4. Use according to any one of claims 1 to 3 wherein the molecular structure of the boranocarbonate compound or ion includes the moiety



5. Use according to claim 4 wherein the boranocarbonate compound or ion includes the moiety BH_3-CO-.

6. Use according to claim 4 or 5 wherein the boranocarbonate is a compound or anion of the formula:

$BH_x(COQ)_yZ_z$

wherein:-

x is 1, 2 or 3

y is 1, 2 or 3

z is 0, 1 or 2

x + y + z = 4,

each Q is O^-, representing a carboxylate anionic form, or is OH, OR, NH_2, NHR, NR_2, SR or halogen, where the or each R is alkyl (preferably of 1 to 4 carbon atoms),

each Z is halogen, NH_2, NHR', NR'_2, SR' or OR' where the or each R' is alkyl (preferably of 1 to 4 carbon atoms).

7. Use according to claim 6 wherein z is 0.

8. Use according to claim 6 or 7 where y is 1.

9. Use according to claim 6 where x is 3.

10. Use according to any one of claims 6 to 9 where the boranocarbonate is an anion, with at least one Q in the form of O^- or OR, and the composition includes at least one metal cation.

11. Use according to claim 10 wherein the or each metal cation is an alkali metal cation or an alkaline earth metal cation.

12. Use according to claim 11 wherein the boranocarbonate is $Na_2(H_3BCO_2)$.

13. Use according to any one of claims 1 to 12 wherein the medicament further includes a guanylate cyclase stimulant or stabilizer.

14. Use according to claim 13 wherein the guanylate cyclase stimulant or stabilizer is a molecule or ion uncombined with the boranocarbonate compound or ion.

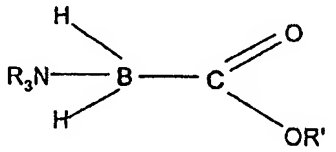
15. Use according to claim 13 or 14 wherein the guanylate cyclase stimulant or stabilizer is YC-1.

16. Use according to any one of claims 13 to 15 wherein the medicament is adapted for one of simultaneous and sequential administration of the boranocarbonate compound or ion and the guanylate cyclase stimulant or stabilizer.

17. Use according to any one of claims 1 to 16 wherein the boranocarbonate compound or ion is other than

I. K_2 (H_3BCOO)

II.



where R, R' = H, alkyl, perfluoroalkyl.

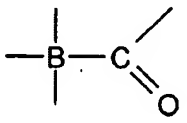
18. Method of treatment of a mammal comprising stimulation of neurotransmission, vasodilation or smooth muscle relaxation by CO as a physiologically effective agent, or the treatment of any of acute or chronic systemic hypertension, radiation damage, endotoxic shock, hyperoxia-induced injury, apoptosis, cancer, transplant rejection, post-operative ileus, arteriosclerosis, post-ischemic organ damage, angina, haemorrhagic shock, sepsis, penile erectile dysfunction, vascular restenosis, hepatic cirrhosis, cardiac hypertrophy, heart failure and ulcerative colitis, or treatment in balloon angioplasty, aortic transplantation or survival of a transplanted organ, by administration of a boranocarbonate

compound or ion adapted to make CO available for physiological effect.

19. Method according to claim 18 comprising stimulation of neurotransmission, vasodilation or smooth muscle relaxation by CO as a physiologically effective agent, or treatment of any of acute or chronic systemic hypertension, hyperoxia-induced injury, cancer by the pro-apoptotic effect of CO, transplant rejection, post-operative ileus, post-ischemic organ damage, angina, haemorrhagic shock, penile erectile dysfunction, hepatic cirrhosis, cardiac hypertrophy, heart failure and ulcerative colitis, or treatment in balloon angioplasty or aortic transplantation.

20. Method according to claim 18 or claim 19 wherein including administration by an oral, intravenous, subcutaneous, nasal, inhalatory, intramuscular, intraperitoneal, transdermal, transmucosal or suppository route.

21. Method according to any one of claims 18 to 20 wherein the molecular structure of the boranocarbonate compound or ion includes the moiety



22. Method according to claim 21 wherein the boranocarbonate compound or ion includes the moiety BH_3-CO-.

23. Method according to claim 21 or 22 wherein the boranocarbonate is a compound or anion of the formula:

$BH_x(COQ)_yZ_z$

wherein:-

x is 1, 2 or 3

y is 1, 2 or 3

z is 0, 1 or 2

$x + y + z = 4$,

each Q is O^-, representing a carboxylate anionic form, or is OH, OR, NH_2, NHR, NR_2, SR or halogen, where the or each R is alkyl (preferably of 1 to 4 carbon atoms),

each Z is halogen, NH_2, NHR', NR'_2, SR' or OR' where the or each R' is alkyl (preferably of 1 to 4 carbon atoms).

24. Method according to claim 23 wherein z is 0.

25. Method according to claim 23 or 24 where y is 1.

26. Method according to claim 23 where x is 3.

27. Method according to any one of claims 23 to 26 where the boranocarbonate is an anion, with at least one Q in the form of O^- or OR, and the composition includes at least one metal cation.

28. Method according to claim 27 wherein the or each metal cation is an alkali metal cation or an alkaline earth metal cation.

29. Method according to claim 27 wherein the boranocarbonate is $Na_2(H_3BCO_2)$.

30. Method according to any one of claims 18 to 29 wherein the medicament further includes a guanylate cyclase stimulant or stabilizer.

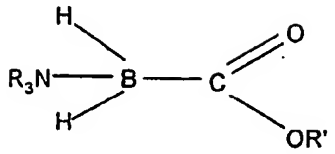
31. Method according to claim 30 wherein the guanylate cyclase stimulant or stabilizer is a molecule or ion uncombined with the boranocarbonate compound or ion.

32. Method according to claim 30 or 31 wherein the guanylate cyclase stimulant or stabilizer is YC-1.

33. Method according to any one of claims 30 to 32 comprising simultaneous or sequential administration of the boranocarbonate compound or ion and the guanylate cyclase stimulant or stabilizer.

34. Use according to any one of claims 18 to 33 wherein the boranocarbonate compound or ion is other than

I. K_2 (H_3BCOO)

II. 

where R, R' = H, alkyl, perfluoroalkyl.

35. A method of treating a viable mammalian organ extracorporeally or an isolated mammalian organ, comprising contacting the organ with a pharmaceutical composition comprising a boranocarbonate compound or ion adapted to make CO available for physiological effect.

36. A method according to claim 35 wherein the boranocarbonate compound or ion is as defined in any one of claims 4 to 12.

37. Method according to 35 or 36 wherein the composition further includes a guanylate cyclase stimulant or stabilizer.

38. Method according to claim 37 wherein the guanylate cyclase stimulant or stabilizer is a molecule or ion uncombined with the boranocarbonate compound or ion.

39. Method according to claim 37 or 38 wherein the guanylate cyclase stimulant or stabilizer is YC-1.

40. A medical or veterinary implant carrying, in a form releasable at the implant site, a boranocarbonate compound or ion adapted to make CO available for physiological effect.

41. An implant according to claim 40 wherein the boranocarbonate compound or ion is as defined in any one of claims 4 to 12.

42. An implant according to 40 or 41 wherein the medicament further includes a guanylate cyclase stimulant or stabilizer.

43. An implant according to claim 42 wherein the guanylate cyclase stimulant or stabilizer is a molecule or ion uncombined with the boranocarbonate compound or ion.

44. An implant according to claim 42 or 43 wherein the guanylate cyclase stimulant or stabilizer is YC-1.

45. A method of introducing CO to a mammal as a therapeutic agent comprising:

a) administering a boranocarbonate which makes available CO suitable for physiological effect; and

b) administering a guanylate cyclase stimulant or stabiliser.

46. A method according to claim 45, which is for the stimulation of neurotransmission, vasodilation or smooth muscle relaxation by CO as a physiologically effective agent, or for the treatment of any of hypertension, radiation damage, endotoxic shock, inflammation, inflammatory-related diseases, hyperoxia-induced injury, apoptosis, cancer, transplant rejection, post-operative ileus, arteriosclerosis, post-ischemic organ damage, myocardial infarction, angina, haemorrhagic shock, sepsis, penile erectile dysfunction, adult respiratory distress syndrome, vascular restenosis, hepatic cirrhosis, cardiac hypertrophy, heart failure and ulcerative colitis or for treatment in balloon angioplasty, aortic transplantation or survival of a transplanted organ.

47. A method according to claim 45, which is for the stimulation of neurotransmission, vasodilation or smooth muscle relaxation by CO as a physiologically effective agent, or for the treatment of any of acute or chronic systematic hypertension, radiation damage, endotoxic shock, hyperoxia-induced injury, apoptosis, cancer, transplant rejection, post-operative ileus, arteriosclerosis, post-ischemic organ damage, angina, haemorrhagic shock, sepsis, penile erectile dysfunction, vascular restenosis, hepatic cirrhosis, cardiac hypertrophy, heart failure and ulcerative colitis or for treatment in balloon angioplasty, aortic transplantation or survival of a transplanted organ.

48. A method according to claim 45, which for the stimulation of neurotransmission, vasodilation or smooth muscle relaxation

by CO as a physiologically effective agent, or for the treatment of any of acute or chronic systematic hypertension, hyperoxia-induced injury, cancer by the pro-apoptotic effect of CO, transplant rejection, post-operative ileus, post-ischemic organ damage, angina, haemorrhagic shock, penile erectile dysfunction, hepatic cirrhosis, cardiac hypertrophy, heart failure and ulcerative colitis or for treatment in balloon angioplasty or aortic transplantation.

49. A method according to claim 45, which is for treatment of any of acute or chronic systemic hypertension, pulmonary hypertension, transplant rejection, post-operative ileus, arteriosclerosis, post-ischemic organ damage, myocardial infarction, penile erectile dysfunction, vascular restenosis, hepatic cirrhosis, cardiac hypertrophy, heart failure, chronic anal fissure, internal anal sphincter disease, anorectal disease, and ulcerative colitis or for treatment in balloon angioplasty or aortic transplantation.

50. A method according to any one of claims 45 to 49 wherein the boranocarbonate compound or ion is as defined in any one of claims 5 to 13.

51. A method according to any one of claim 45 to 50 wherein the guanylate cyclase stimulant or stabilizer is a molecule or ion uncombined with the boranocarbonate compound or ion.

52. A method according to any one of claims 45 to 51 wherein the guanylate cyclase stimulant or stabilizer is YC-1.

53. A pharmaceutical composition comprising:

a) a boranocarbonate compound or ion which makes available CO suitable for physiological effect; and

b) a guanylate cyclase stimulant or stabiliser.

54. A composition according to claim 53 wherein the boranocarbonate compound or ion is as defined in any one of claims 4 to 12.

55. A composition according to claim 53 or 54 wherein the guanylate cyclase stimulant or stabilizer is a molecule or ion uncombined with the boranocarbonate compound or ion.

56. A composition according to any one of claims 53 to 55 wherein the guanylate cyclase stimulant or stabilizer is YC-1.

57. A composition according to any one of claims 53 to 56, adapted for one of simultaneous and sequential administration of the boranocarbonate compound or ion and the guanylate cyclase stimulant or stabilizer.